Remarks

I. Status

No amendments have been made to the specification or claims. Claims 1-35 are currently pending.

II. Section 103 Rejections

Claims 1, 9, 11-13, 15, 28-30, 32, 34, and 35

Claims 1, 9, 11-13, 15, 28-30, 32, 34, and 35 were rejected under Section 103(a) as being unpatentable over Droppo et al. (U.S. Patent No. 6,959,276) in view of Yang et al. (U.S. Patent Application Publication No. 2003/0040908) ("Droppo-Yang combination"). Independent Claim 1 recites a first noise detector that is adapted to detect a wind buffet from an input signal by modeling, and a noise attenuator electrically connected to the first noise detector to substantially remove the wind buffet from the input signal. The Droppo-Yang combination does not teach these features and Assignee respectfully submits that these features were not well known in the art. The Office Action asserts that the environment identification unit 609, col. 9, ll. 1-4, and col. 10, ll. 50-55 of Droppo show a first noise detector that is adapted to detect "specific environmental noise types" from an input signal by modeling. (Office Action, pp. 2-3). The Office Action also asserts that the noise reduction module 610 and col. 10, ll. 50-60 of Droppo show a noise attenuator that substantially removes the "identified noise type" from the input signal. (Office Action, p. 3). The Office Action admits that Droppo does not disclose a first noise detector that is adapted to detect a wind buffet from an input signal by modeling, and does not disclose a noise attenuator electrically connected to the first noise detector to substantially remove the wind buffet from the input signal, as recited in Claim 1, and relies on Yang to show these features. (Office Action, p. 3).

The environment identification unit 609 and Steps 502-504 in Droppo identify a noise environment for feature vectors in a frame of a speech signal. (Droppo, col. 9, ll. 1-4; Steps 502-504). In particular, the environment identification unit 609 and Step 502 determine a set of probabilities that a noise in a noisy feature vector was generated in a particular environment, such as a car, office, or airplane. (Droppo, col. 9, ll. 5-10; col. 1, ll. 53-61; Step 502). The probabilities are used in Step 504 to identify an environment for the frame. (Droppo, col. 10, ll. 7-9; Step 504). The noise reduction module 610 in Droppo selects and

applies a correction vector to the noisy feature vector, based on the identified environment and the noisy feature vector. (Droppo, col. 10, ll. 55-58). The noise reduction module 610 accesses stored parameters for the identified environment and then selects a correction vector associated with the closest codeword to the noisy feature vector in the identified environment. (Droppo, col. 10, ll. 58-65). A clean feature vector is generated by the noise reduction module 610 by applying the selected correction vector to the noisy feature vector. (Droppo, col. 10, ll. 65-68).

Yang discloses using two signal detectors, where the first signal detector detects a signal s(t) with a speech component and a noise component, and the second signal detector detects a signal x(t) with a mostly noise component. (Yang, ¶¶ 6, 22, 24). The second signal detector is placed so that mostly noise is detected, such as on the floor of an automobile near the chassis. (Yang, ¶¶ 22, 23). Yang removes noise from the signal s(t) that is correlated with the noise in the second signal x(t) to produce an intermediate signal d(t) having speech and some amount of noise. (Yang, ¶ 27). Yang further removes noise from the intermediate signal d(t) by performing a spectrum modification of d(t) with a time-varying noise spectrum N(ω) that is based on the mostly noise signal x(t). (Yang, ¶¶ 29, 70).

The Droppo-Yang combination includes no teaching or suggestion to detect a wind buffet from an input signal by modeling, or to substantially remove a wind buffet from an input signal, as recited in Claim 1. Droppo only attempts to <u>identify an environment</u>, e.g., a car, airplane, or office, that a sound signal was generated in, but does not <u>detect a wind buffet</u> or any particular type of noise. (Droppo, col. 9, ll. 1-4; col. 1, ll. 53-61; Steps 502-504). Also, because Droppo merely identifies an environment and does not identify noise types, the noise reduction module 610 does not substantially remove an "identified noise type," as asserted by the Office Action. Instead, Droppo uses the identified environment to select a correction vector for use in generating a clean feature vector from a noisy feature vector. (Droppo, col. 10, ll. 58-68).

Furthermore, Yang detects a mostly noise signal with a second signal detector <u>without modeling</u>, because the mostly noise signal is directly detected based solely on the placement of the second signal detector. (Yang, ¶¶ 6, 22). Yang does not teach or suggest <u>detecting a wind buffet</u> from an input signal by modeling, but instead <u>removes</u> noise from a signal: (1) by removing noise in signal s(t) by correlating s(t) with the mostly noise signal x(t); and (2) by performing a spectrum modification of the intermediate signal d(t) with the time-varying

noise spectrum $N(\omega)$ that is based on the mostly noise signal $x(t)$. (Yang, ¶¶ 27, 29, 70). Yang proceeds without specifically detecting a wind buffet by modeling, as claimed in Claim 1. Therefore, even if the Droppo-Yang combination is made, the combination does not include all of the features recited in Claim 1. Claim 1 is patentable for at least the above reasons. Claims 9, 11-13, and 15 are also patentable at least because they depend from Claim 1, their independent allowable base claim.

Independent Claim 28 recites a computer readable medium comprising a signal analysis logic that models a portion of the sound waves that are associated with the wind to detect a wind buffet. The Droppo-Yang combination does not teach this feature and Assignee respectfully submits that this feature was not well known in the art. The Office Action asserts that the environment identification unit 609, col. 9, ll. 1-4, and col. 10, ll. 50-55 of Droppo show a signal analysis logic that models a portion of the sound waves that are associated with "an environmental noise source." (Office Action, pp. 5-6). The Office Action admits that Droppo does not teach a signal analysis logic that models a portion of the sound waves that are associated with the wind to detect a wind buffet, as recited in Claim 28, and relies on Yang to show this feature. (Office Action, p. 6).

As discussed previously, Droppo only attempts to identify an environment, and does not detect a wind buffet or any particular noise type. (Droppo, col. 9, ll. 1-4; Steps 502-504). Yang detects a mostly noise signal with a second signal detector without modeling, based on the placement of the second signal detector. (Yang, ¶¶ 6, 22). The Droppo-Yang combination contains no teaching or suggestion to model a portion of sound waves that are associated with wind to detect a wind buffet, as recited in Claim 28. Droppo only discloses identifying the <u>environment</u> a sound signal is generated in, and not an "environmental noise source," let alone a wind buffet. (Droppo, col. 9, ll. 5-10). Furthermore, Yang performs no modeling since the detected signal is assumed to be mostly noise from the second signal detector. (Yang, ¶¶ 6, 22). Yang also does not <u>detect a wind buffet</u> by modeling a portion of sound waves but instead removes noise from a signal. (Yang, ¶¶ 27, 29, 70). Therefore, even if the Droppo-Yang combination is made, the combination does not include all of the features recited in Claim 28, and Claim 28 is patentable for at least these reasons. Claims 29, 30, 32, 34, and 35 are also patentable at least because they depend from Claim 28, their independent allowable base claim.

Claims 2, 8, 16, 18-20, 23, 24, 26, and 27

Claims 2, 8, 16, 18-20, 23, 24, 26, and 27 were rejected under Section 103(a) as being unpatentable over Droppo in view of Yang and Ljung ("System Identification Theory for the User") ("Droppo-Yang-Ljung combination"). Claims 2 and 8 are patentable at least because they depend from Claim 1, their independent allowable base claim.

Independent Claim 16 recites a memory comprising wind buffet line fitting rules and a wind noise detector configured to apply the wind buffet line fitting rules to a line fit to a portion of the input signal in the frequency domain to obtain a constrained line adhering to the wind buffet line fitting rules. Claim 16 also recites that the wind noise detector is configured to automatically identify a noise associated with wind based on the constrained line. Independent Claim 23 recites a memory comprising wind buffet line fitting rules and a wind noise detector configured to fit a line to a portion of an input signal, and further configured to apply the wind buffet line fitting rules to the line to obtain a constrained line adhering to the wind buffet line fitting rules.

The Droppo-Yang-Ljung combination does not teach these features and Assignee respectfully submits that this feature was not well known in the art. The Office Action asserts that the environment identification unit 609 and col. 9 l. 1 through col. 10, l. 27 of Droppo show a "specific environment" detector, that the "Environment Identifier applies rules" to a portion of the input signal, and automatically identifies a noise associated with "a specific environment based on a model." (Office Action, pp. 9 and 12). The Office Action admits that Droppo does not disclose a memory comprising wind buffet line fitting rules and a wind noise detector configured to apply the wind buffet line fitting rules to a line fit to a portion of the input signal in the frequency domain to obtain a constrained line adhering to the wind buffet line fitting rules. (Office Action, pp. 10-12). Instead, the Office Action relies on Yang and Ljung to show these features. (Office Action, pp. 10-12).

As discussed previously, Droppo only attempts to identify a noise environment, e.g., a car, airplane, or office, which a sound is generated in. (Droppo, col. 9, ll. 1-4; col. 1, ll. 53-61; Steps 502-504). Yang detects a mostly noise signal with a second signal detector without modeling, based on the placement of the second signal detector. (Yang, ¶¶ 6, 22). Ljung describes generic processing of observed data. (Ljung, p. 7). Ljung further describes the least squares method of fitting calculated values to measured outputs. (Ljung, pp. 8-9).

The Droppo-Yang-Ljung combination contains no teaching or suggestion of wind buffet line fitting rules, a wind noise detector configured to apply the wind buffet line fitting rules to a line fit to a portion of the input signal in the frequency domain to obtain a constrained line adhering to the wind buffet line fitting rules, or a wind noise detector configured to automatically identify a noise associated with wind based on a constrained line, as recited in Claims 16 and 23. Ljung discusses the least squares method of fitting calculated values to measured outputs. (Ljung, pp. 7-9). Ljung includes no teaching or suggestion of wind buffet line fitting rules or applying rules relating to wind buffets to obtain a constrained line.

Furthermore, Droppo discloses identifying the environment a sound signal is generated in, not identifying wind noise. (Droppo, col. 9, ll. 5-10). Yang merely detects a mostly noise signal with a second signal detector that is placed where the detected sound is assumed to be mostly noise. (Yang, ¶¶ 6, 22). Droppo, Yang, or Ljung, individually or in combination, do not disclose a wind noise detector that applies wind buffet line fitting rules to a line fit to a portion of the input signal in the frequency domain to obtain a constrained line adhering to the wind buffet line fitting rules, or a wind noise detector configured to automatically identify a noise associated with wind based on a constrained line. Therefore, even if the Droppo-Yang-Ljung combination is made, the combination does not include all of the features recited in Claim 16 and 23, and Claims 16 and 23 are patentable for at least these reasons. Claims 18-20 are also patentable at least because they depend from Claim 16, their independent allowable base claim.

Independent Claim 24 recites a method of dampening a wind buffet from an input signal including the step of detecting the wind buffet when a high correlation exists between a line and a portion of an input signal. Independent Claim 27 recites a method of removing a wind buffet from an input signal including the step of detecting the wind buffet when a high correlation exists between a line and a portion of an input signal. The Droppo-Yang-Ljung combination does not teach these features and Assignee respectfully submits that these features were not well known in the art. The Office Action asserts that the environment identification unit 609 and col. 9, l. 1 to col. 10, l. 27 of Droppo show detecting the "environmental noise" when a high correlation exists between the line and portion of the input signal. (Office Action, pp. 12-13 and 15). The Office Action admits that Droppo does

not disclose detecting a wind buffet when a high correlation exists between the line and portion of the input signal, as recited in Claims 24 and 27. (Office Action, pp. 13-14). Instead, the Office Action relies on Yang and Ljung to show these features. (Office Action, pp. 13-14).

As discussed previously, Droppo only attempts to identify a noise environment, e.g., a car, airplane, office, that a sound is generated in. (Droppo, col. 9, ll. 1-4; Steps 502-504). Yang detects a mostly noise signal with a second signal detector without modeling, based on the placement of the second signal detector. (Yang, ¶¶ 6, 22). The Droppo-Yang-Ljung combination contains no teaching or suggestion to detect a wind buffet when a high correlation exists between a line and a portion of an input signal, as recited in Claims 24 and 27. Droppo only discloses identifying the environment a sound signal is generated in, but does not detect an "environmental noise source," let alone a wind buffet. (Droppo, col. 9, ll. 5-10). Droppo selects an environment based on probabilities that a particular noise was generated in a particular environment. (Droppo, Steps 502 and 504). Droppo does not detect a wind buffet or any particular noise when a high correlation exists between a line and a portion of an input signal. Yang also does not show the features recited in Claims 24 and 27. Yang merely detects a mostly noise signal x(t) without regard to any correlation between a line and a portion of the input signal. (Yang, ¶¶ 6, 22). Therefore, even if the Droppo-Yang-Ljung combination is made, the combination does not include all of the features recited in Claims 24 and 27, and Claims 24 and 27 are patentable for at least these reasons.

Claim 26 is patentable at least because it depends from Claim 24, its independent allowable base claim. In addition, Claim 26 recites that detecting the wind buffet comprises applying wind buffet line fitting rules to the line to obtain a constrained line adhering to the wind buffet line fitting rules. The Droppo-Yang-Ljung combination does not teach this feature. The Office Action asserts that Ljung shows the wind buffet line fitting rules and relies on the previous discussion in the Office Action relating to Ljung for the rejection of Claim 26. (Office Action, p. 15). As discussed previously, Ljung describes generic processing of observed data and discusses the least squares method of fitting calculated values to measured outputs. (Ljung, pp. 7-9). Ljung does not teach or suggest wind buffet line fitting rules and applying rules relating to wind buffets to a line to obtain a constrained line. Therefore, even if the Droppo-Yang-Ljung combination is made, the combination does

not include all of the features recited in Claim 26 and Claim 26 is patentable for at least these reasons as well.

Claims 4, 10, and 31

Claims 4, 10, and 31 were rejected under Section 103(a) as being unpatentable over Droppo in view of Yang and further in view of Buchele (U.S. Patent Application Publication No. 2003/0151454) ("Droppo-Yang-Buchele combination"). Claims 4, 10, and 31 are patentable at least because they depend from their respective independent allowable base claims.

In addition, Claim 4 recites that the first noise detector is configured to model the wind buffet by calculating a y-intercept for a line fit to the input signal. The Droppo-Yang-Buchele combination does not teach this feature. The cited paragraphs of Buchele disclose a peak detector circuit that helps to suppress single wind gusts when a sound pressure level ("SPL") exceeds a certain threshold. (Buchele, ¶¶ 34, 40). The Droppo-Yang-Buchele combination, even if made, does not teach that the noise detector is configured to model the wind buffet by calculating a y-intercept for a line fit to the input signal. Instead, the peak detector disclosed in Buchele only detects if the SPL of a wind gust is above a threshold and fully engages the adaptive filter if the SPL is above the threshold. (Buchele, ¶¶ 34, 40). Therefore, even if the Droppo-Yang-Buchele combination is made, the combination does not include all of the features recited in Claim 4 and Claim 4 is patentable for at least these reasons as well.

Claims 3, 5, 6, 7, 14, 17, 21, 22, 25, and 33

Dependent Claims 3, 5, 6, 7, 14, 17, 21, 22, 25, and 33 were rejected under Section 103(a). The claims are patentable at least because they depend from their respective independent allowable base claims.

III. Summary

Assignee respectfully submits that the pending claims are patentable. If the Examiner believes that a telephone interview would be helpful in resolving any outstanding issues, the Examiner is respectfully invited to contact the undersigned at the telephone number listed below.

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